

What is Claimed Is:

1. In a code-division-multiple-access (CDMA) system employing spread-spectrum modulation comprising a base station (BS) comprising a BS-spread-spectrum transmitter and a BS-spread-spectrum receiver, and at least one mobile stations (MS) comprising an MS-spread-spectrum transmitter and an MS-spread-spectrum receiver, a method comprising the steps of:
  - 5 transmitting from the MS-spread-spectrum transmitter of the one mobile station a spread-spectrum signal signifying a request to utilize an uplink channel;
  - receiving the request to utilize the uplink channel from the one mobile station at the BS-spread-spectrum receiver;
  - processing the received request to determine whether or not to grant the requested access;
    - 10 if the processing results in a determination to grant access, transmitting from the BS-spread-spectrum transmitter a spread spectrum signal comprising a channel-request-granted message for the one mobile station, the channel-request-granted message comprising control information specifying a transmission start time and a transmission length;
  - 15 receiving the channel-request-granted message from the base station at the MS-spread-spectrum receiver the one mobile station;
  - at the specified transmission start time, initiating transmission from the BS-spread-spectrum transmitter of a spread spectrum signal comprising control signaling related to the granted access over a downlink channel;
  - 20 receiving the spread spectrum signal comprising control signaling at the MS-spread-spectrum receiver the one mobile station;
  - at a predetermined time after the specified transmission start time, starting transmission of a spread spectrum signal containing packet data over the uplink channel from the MS-spread-spectrum transmitter of the one mobile station, in a manner in accord with the received control information; and
  - 25 ceasing the transmission of the spread spectrum signal containing packet data over the uplink channel from the mobile station, upon completion of transmission of packet data of the specified transmission length.

2. The method of claim 1, wherein when the transmission of the spread spectrum signal containing packet data over the uplink channel ceases, the uplink physical dedicated channel is immediately released.

3. The method of claim 1, wherein the channel-request-granted message further comprises at least one of Hybrid-ARQ (Automatic Repeat reQuest) information, data identifying an uplink modulation scheme, and an uplink channelization code related to an uplink physical dedicated channel assigned for use by the MS spread-spectrum transmitter of  
5 the one mobile station.

4. The method of claim 1, wherein:  
the transmitting of the spread spectrum signal comprising the channel-request-granted message utilizes a downlink forward access channel; and  
transmission from the BS-spread-spectrum transmitter of a spread spectrum signal  
5 comprising control signaling related to the granted access uses a downlink packet sharing channel.

5. The method of claim 4, wherein control information comprises at least one of Hybrid-ARQ (Automatic Repeat reQuest) information, data identifying an uplink modulation scheme, and an uplink channelization code related to the transmission by the one mobile station on the uplink physical dedicated channel.

6. The method of claim 1, further comprising:  
transmitting from the MS-spread-spectrum transmitter of the one mobile station a spread-spectrum signal containing format information,  
wherein the transmission signal containing the format information begins between the  
5 specified transmission start time and the predetermined time after the specified start time.

7. The method of claim 6, wherein the transmitting of the spread-spectrum signal containing format information utilizes an uplink packet control channel.

8. The method of claim 1, wherein the uplink channel is a physical dedicated channel.

9. The method of claim 1, wherein the uplink channel is a common packet channel.

10. The method of claim 1, wherein the request to utilize the uplink channel comprises control information specifying a buffer state of the one mobile station or a quality of service level desired for the requested access.

11. In a wireless code-division-multiple-access (CDMA) spread-spectrum communication network comprising a base station for serving one or more mobile stations, a method comprising:

receiving a data channel initialization request, for access to an uplink channel, at the  
5 base station from one mobile station;

determining whether or not to grant the mobile station the requested access to the uplink channel;

if it is determined to grant the mobile station the requested access to the uplink channel,  
transmitting a channel-request-granted message for the one mobile station, the channel-request-  
10 granted message comprising control information specifying a transmission start time and a  
transmission length;

at the specified start time, initiating transmission of control signaling related to the  
requested access, for the one mobile station; and

15 receiving a packet data transmission of the specified transmission length from the one  
mobile station over the uplink channel.

12. The method of claim 11, wherein the control information in the channel-request-  
granted message further comprises at least one of Hybrid-ARQ (Automatic Repeat reQuest)  
information, data identifying an uplink modulation scheme, and an uplink channelization code  
related to the transmission by the one mobile station on the uplink physical dedicated channel.

13. The method of claim 11, wherein the control signaling related to the requested  
access, for the one mobile station, comprises a least one of Hybrid-ARQ (Automatic Repeat  
reQuest) information, data identifying an uplink modulation scheme, and an uplink  
channelization code related to the transmission by the one mobile station on the uplink channel.

14. The method of claim 11, wherein

the transmitting of the channel-request-granted message utilizes a downlink forward access channel; and

transmitting of the control signaling related to the granted access uses a downlink  
5 packet sharing channel.

15. The method of claim 11, further comprising releasing at least one resource related to the uplink physical dedicated channel when the reception of the packet data over the uplink channel ceases after receipt of the transmission of the specified length.

16. The method of claim 11, wherein the uplink channel is a physical dedicated channel.

17. The method of claim 11, wherein the uplink channel is a common packet channel.

18. In a wireless code-division-multiple-access (CDMA) spread-spectrum communication network comprising a base station for serving one or more mobile stations, a method comprising:

transmitting a data channel initialization request, for access to an uplink channel, to the  
5 base station from one mobile station;

receiving a channel-request-granted message at the one mobile station, the channel-request-granted message comprising control information specifying a start time and a transmission length;

after the specified start time, receiving control signaling related to the requested access  
10 at the one mobile station; and

transmitting packet data from the one mobile station over the uplink channel of the specified transmission length, beginning at a time following initial reception of the control signaling.

19. The method of claim 18, further comprising transmitting format information associated with the packet data from the one mobile station, following receiving of the control signaling and before beginning the transmitting of the packet data over the uplink channel.

20. The method of claim 19, wherein the uplink channel comprises a physical dedicated channel.

21. The method of claim 20, wherein the transmitting of the format information utilizes an uplink packet control channel.

22. The method of claim 20, wherein:

the channel-request-granted message is received over a downlink forward access channel; and

the control signaling related to the requested access is received over a downlink packet sharing control channel.  
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23. A base station for use in a code-division-multiple-access (CDMA) system employing spread-spectrum modulation, the base station (BS) comprising:

a BS-spread-spectrum transceiver system, for transmitting and receiving spread-spectrum modulated signals to and from a mobile station; and

5 a media access control interface, coupled to the BS-spread-spectrum transceiver system, for receiving and sending packet data between a network and the BS-spread-spectrum transceiver system, and for controlling signal communications of the BS-spread-spectrum transceiver system in support of wireless communications operations of the base station, such that in operation, the base station is for performing the following sequence of operations:

10 receiving a data channel initialization request, for access to an uplink channel, at the base station from one mobile station;

determining whether or not to grant the mobile station the requested access to the uplink channel;

15 if it is determined to grant the mobile station the requested access to the uplink channel, transmitting a channel-request-granted message for the one mobile station, the channel-request-granted message comprising control information specifying a transmission start time and a transmission length;

at the specified start time, initiating transmission of control signaling related to the requested access, for the one mobile station; and

20 receiving a packet data transmission of the specified transmission length from the one mobile station over the uplink channel.

24. The base station as in claim 23, wherein the BS-spread-spectrum transceiver system comprises a base band processor.

25. The base station as in claim 24, wherein the base band processor comprises:  
a spread-spectrum transmitter;  
a spread spectrum receiver;  
a controller, responsive to signals from the spread-spectrum receiver and the media  
5 access control interface, for controlling operations of the spread-spectrum transmitter.

26. The base station as in claim 25, wherein the spread-spectrum transmitter transmits the channel request-granted message on a downlink forward access channel and transmits the control signaling on a downlink packet sharing control channel.

27. A mobile station for use in a code-division-multiple-access (CDMA) system employing spread-spectrum modulation, the mobile station (MS) comprising:

an MS-spread-spectrum transceiver system, for transmitting and receiving spread-spectrum modulated signals to and from a mobile station; and

5 a media access control interface, coupled to the MS-spread-spectrum transceiver system, for receiving and sending packet data for the mobile station through the MS-spread-spectrum transceiver system, and for controlling signaling communications of the MS-spread-spectrum transceiver system in support of wireless communications operations of the mobile station through with a base station of the CDMA system, such that in operation, the mobile  
10 station is for performing the following sequence of operations:

transmitting a data channel initialization request, for access to an uplink channel, to the base station from one mobile station;

receiving a channel-request-granted message at the one mobile station, the channel-request-granted message comprising control information specifying a start time and a  
15 transmission length;

after the specified start time, receiving control signaling related to the requested access at the one mobile station; and

transmitting packet data from the one mobile station over the uplink channel of the specified transmission length, beginning at a time following initial reception of the control  
20 signaling.

28. The mobile station of claim 27, wherein the operations performed by the mobile station further comprise transmitting format information associated with the packet data from the one mobile station, following receiving of the control signaling and before beginning the transmitting of the packet data over the uplink channel.

29. The mobile station of claim 27, wherein the MS-spread-spectrum transceiver system comprises a base band processor.

30. The mobile station as in claim 27, wherein the base band processor comprises:  
a spread-spectrum transmitter;  
a spread spectrum receiver;  
a controller, responsive to signals from the spread-spectrum receiver and the media  
5 access control interface, for controlling operations of the spread-spectrum transmitter.

31. The mobile station as in claim 30, wherein the spread-spectrum transmitter transmits the channel request message on an uplink packet control channel.

32. The mobile station as in claim 30, wherein the spread-spectrum transmitter transmits format information associated with the packet data from the one mobile station to the base station via the uplink packet control channel.

33. In a wireless code-division-multiple-access (CDMA) spread-spectrum communication network comprising a base station for serving one or more mobile stations, a method comprising:

sending control signaling to and receiving a packet data transmission from, one mobile  
5 station, over at least one CDMA spread-spectrum wireless channel;

detecting a length of inactivity on the at least one CDMA spread-spectrum wireless channel after the sending and receiving;

in response to the detected inactivity, sending a power down request message to the one mobile station;

10 receiving a power down confirmation message from the one mobile station; and  
transmitting at least one further signal for the one mobile station at a reduced power.

34. The method of claim 33, wherein the step of sending control signaling to and receiving a packet data transmission from, one mobile station comprises:

receiving a data channel initialization request, for access to an uplink channel, from the one mobile station;

5 determining whether or not to grant the mobile station the requested access to the uplink channel;

if it is determined to grant the mobile station the requested access to the uplink channel, transmitting a channel-request-granted message for the one mobile station, the channel-request-granted message comprising control information specifying a transmission start time and a  
10 transmission length;

at the specified start time, initiating transmission of control signaling related to the requested access, for the one mobile station; and

receiving a packet data transmission of the specified transmission length from the one mobile station over the uplink channel.